Contractor Assurance System (CAS) Description

This plan is the Ames Laboratory Contractor Assurance System (CAS) Description. It provides details regarding key processes implemented by line management, internal oversight functions, and independent oversight organizations to ensure the Ames Laboratory's mission success, and describes the governance role of Iowa State University (ISU).

1.0 APPROVAL RECORD

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- Approved by: Dr. Elizabeth Hoffman, ISU Executive Vice President and Provost
- Approved by: Dr. Gregory Geoffrey, ISU President

The official approval record for this document is maintained in the Training & Records Management Office, 151 TASF.

2.0 REVISION/REVIEW INFORMATION

The revision description for this document is available from and maintained by the author.

3.0 PURPOSE AND SCOPE

Overview of Ames Laboratory

The Ames Laboratory is located on the campus of Iowa State University (ISU) in Ames, Iowa, approximately 35 miles north of Des Moines, and is operated by ISU through a management and operating (M&O) contract with the DOE Office of Science. The Laboratory's mission focus is on materials science, engineering, analytical instrumentation, and chemical sciences that provides expertise to the DOE laboratory system in the areas of energy and environmental improvement. Ames Laboratory also operates the Materials Preparation Center (MPC) which provides capabilities in preparation, purification, fabrication and characterization of materials in support of R&D programs throughout the world. In addition, the Laboratory collaborates with other federal agencies including the National Institute of Justice, Department of Defense, various law enforcement agencies, as well as many corporate entities to transfer technology that benefits the U.S. economy and the environment.

The Ames Laboratory is situated on approximately 10 acres of state-owned land on the ISU campus under a long-term, no-cost lease. There is no federally owned land at the site. Real property assets owned by the DOE include 12 buildings that total 327,664 gross square feet. There are three laboratory buildings, one office building, eight other support function buildings (smaller shop and storage buildings, and two other real property items (an electrical switch pit and a parking lot). Staffing is approximately 600 full- and part-time staff representing about 300 full-time equivalents (FTE). In addition, there are also 200 associates, mostly ISU faculty and graduate students, who perform research in Ames Laboratory facilities.

Located on the ISU campus, the Laboratory is dependent upon infrastructure services provided

by the university, such as steam, chilled water, water and sewage service, compressed air, grounds maintenance, telecommunication systems, and roads. The contract with ISU also enables the Ames Laboratory to use space in university–owned buildings through a space utilization agreement.

The Ames Laboratory also uses numerous business services offered through ISU due to the close physical and operational integration of the activities of the Ames Laboratory and ISU, and services provided by the City of Ames. Among these services are the functions of check writing; patents and licenses processing; human resource processes such as payroll and benefits; City of Ames utilities; security support through ISU and City of Ames police departments; and ambulance, emergency and fire response services through the City of Ames. Such relationships are cost effective and allow Ames Laboratory to focus its management on the direct support of scientific mission objectives. The Laboratory maintains offices which provide supplemental services and operational liaison relationship for these ISU and City of Ames services. In some situations the Laboratory's operational and business functions are subject to departmental oversight and assurance processes within both Ames Laboratory and ISU.

The purpose of DOE's oversight policy is to protect the public, workers, environment, and national security assets effectively through continuous improvement. The DOE Office of Science developed and adopted an Assurance Program Description that defines "assurance" and the founding principles for assurance systems deployed by its contractors. It further identified key components of contractor assurance systems as well as key functions, roles, and outcomes. Assurance is designed to ensure mission objectives are met; workers, the public, and the environment are protected; operational, facility, and business systems are effectively run; and contract requirements are met. At the Ames Laboratory and ISU, mission success is dependent upon teamwork, innovation, and continuous improvement, coupled with an effective partnership and trusting relationship with the Ames Site Office, the Office of Science, and the DOE. Ames Laboratory, ISU and the Ames Site office executed a Partnership Commitment document that further demonstrates the responsibilities accepted by all parties.

The Ames Laboratory operates under numerous assurance related requirements defined by Iowa State University's contract with the Department of Energy (Contract number DE-AC02-07CH11358) for the management and operation of the Ames Laboratory. Clause No. H.42, Contractor Assurance System, added in January of 2010, requires the development of a contractor assurance system that is executed by the contractor's corporate oversight entity. The contract clause also includes a requirement for a CAS description: "A comprehensive description of the assurance system with processes, key activities and accountabilities clearly identified." This plan is the description of the Ames Laboratory Contractor Assurance System (CAS).

The Ames Laboratory CAS is comprehensive and integrated with its organizational units, with ISU's corporate governance functions, and with the DOE Office of Science and the DOE Ames Site Office (AMSO) oversight programs and responsibilities. Its scope includes all contractor staff and operations, including business systems, and its mechanisms are applied with rigor commensurate with identified risks.

The Ames Laboratory CAS is fully integrated with the mechanisms and processes established by its Integrated Safety Management System, Integrated Safeguards and Security Management System, and Quality Assurance Program. These programs address many of the same principles and objectives pertinent to contractor assurance systems and are the foundation of Laboratory's

CAS. The Laboratory's processes are designed to ensure compliance with applicable requirements, pursue excellence through continuous improvement, provide for timely identification and correction of deficient conditions, and verify the effectiveness of completed corrective actions.

This plan was submitted to the DOE Ames Site Office for approval, and to ensure that Ames Laboratory's comprehensive assurance systems and DOE's oversight programs are integrated and provide assurance that DOE and Ames Laboratory activities are managed in a financially prudent, safe, and secure manner for continued success of the DOE mission.

4.0 ROLES AND RESPONSIBILITIES

Iowa State University (ISU) performs management and operation of the Ames Laboratory in accord with its contract with the Department of Energy, and the accountability and authority for the execution of the Ames Laboratory Contractor Assurance System (CAS) is maintained by the ISU Vice President for Business & Finance. Also, the ISU - Ames Laboratory relationship makes available the university's operational systems wherever it provides a strategic advantage, thus allowing Ames Laboratory to focus on its scientific program and mission success.

The ISU Organizational Structure

The ISU president is the principal university administrative officer and is directly responsible to the State of Iowa Board of Regents for the operation of the university, and, as such, is also directly responsible for recommending the appointment of administrative officers who carry university-wide responsibility. ISU has established a comprehensive organizational structure. The university executive vice president and provost is the chief academic officer. The provost coordinates and administers the academic, outreach, and research programs and the personnel policies of the university. The provost also provides leadership oversight to the Ames Laboratory director. The vice president for business and finance manages the fiscal operations of the university, is responsible for the general supervision of business operations of all university activities, and provides contract management oversight for the contract with DOE for operation of the Ames Laboratory.

The interface of ISU's organizational structure and its corporate governance responsibilities for Ames Laboratory is represented in the Ames Laboratory organizational chart by the inclusion of the university's president, executive vice-president/provost, and vice president for business and finance. Additional university oversight is manifested through the Iowa State University/Ames Laboratory Oversight Board. As an operational enhancement under the new contract that started on December 4, 2006, ISU reconstituted the Ames Laboratory Oversight Board (ALOB). The former board was revamped into the ALOB, supported by the Operations Review Committee (ALORC) that reports to the ALOB. The executive board of the ALOB consists of ISU's president, executive vice-president/provost, vice president for business and finance, vice president for research and economic development, and the Ames Laboratory director. The full ALOB consists of the executive board and two or three distinguished members of the scientific community from outside of ISU. The ALORC consists of six members of the ISU staff and is headed by the vice-president for business and finance. The Oversight Board's Charter establishes the scope of responsibilities, authority, and composition of the board, and establishes the executive committee and the ALORC. The ALORC meets quarterly and provides feedback to the university president and provost.

The ALOB focuses primarily on the scientific mission of the Ames Laboratory and significant

Laboratory issues. As part of its scientific oversight it conducts mid-term reviews of the major scientific programs. The ALOB also aids in the hiring of faculty that jointly support the university and the Ames Laboratory. These joint hires help to develop new research areas that meet the needs of the DOE missions, and emphasize one of the Ames Laboratory's core missions: to educate and train the next generation of scientists.

The ALORC's focus is directed toward the operations of the Ames Laboratory. Topics of interest include: performance goals and results, financial condition, Environment, Safety, and Health (ES&H), security, staffing and compensation, legal, facilities planning and management, and other operations issues. The committee provides guidance in areas where university policy requires one response and DOE policy requires a different response. In situations where ISU can provide an easy fix, it will alter its policy or work with the Laboratory to provide flexibility in university policy to allow the Ames Laboratory to operate in accordance with DOE directives.

The ISU president also serves as a member of the national laboratory contractor organization that meets periodically with the Secretary of Energy. The forum provides a direct line of communication to better understand the needs of the primary customer – DOE – and enhances the ability of the ALOB to match the needs of DOE with the strengths of the Ames Laboratory.

In addition to the interactions with the oversight board, the Ames Laboratory director has regularly scheduled meetings with the ISU provost and executive vice president for academic affairs, at least once per month. These meetings ensure an open flow of information concerning administrative, operational and strategic issues that affect the Ames Laboratory and its interactions with the university. The director also has monthly meetings with the ISU vice provost for research and economic development. These meetings provide for information exchange concerning research planning, research opportunities, economic outreach, and other programmatic collaborations between the Laboratory and the university. The director is also a member of the ISU Senior Leadership, a council comprising the Vice President, Deans, and Associate Provosts, chaired by the Provost. The Senior Leadership meets approximately once in every two weeks to discuss budget and policy issues.

The Ames Laboratory Organizational Structure

The university maintains a business structure for Ames Laboratory as defined by its organizational chart, and an Ames Laboratory Business Plan (Laboratory Plan) to support its mission objectives to support its mission objectives. Also a Strategic Plan provides a map for the direction of science and technology at the Ames Laboratory, including its vision:

> *The Ames Laboratory will be our Nation's premier research institute in critical areas of condensed matter science, its related technologies, and the strategic applications of advanced materials.*

and its mission:

> *The Ames Laboratory creates materials, inspires minds to solve problems, and addresses global challenges.*

The Ames Laboratory website provides information about the Laboratory and its core values.

The Ames Laboratory uses a distinct and unified management and organizational system, supplemented by documented requirements, to establish clear and defined roles, responsibilities, and authorities. The organizational structure of the Laboratory includes a directorship office, a scientific division, a technical and administrative division, the Sponsored Research Administration office and the Scientific Planning office. The directorship (the director and deputy director) provides direct supervision of several departments (Public Affairs; Environment, Safety, Health & Assurance; and Safeguards and Security). The Ames Laboratory Internal Audit office reports to the State of Iowa Board of Regents through the ISU vice president for business and finance; administratively, the internal auditors report to the director of the Laboratory.

The director, deputy director, chief research officer, associate director, and chief operations officer form the executive council of Ames Laboratory. The members of the executive council provide the primary contact with DOE and meet weekly to discuss mission oriented issues that lay the groundwork for the scientific direction and day-to-day operation of the Laboratory. The executive council is responsible for strategic planning and the vision of the Ames Laboratory as well as guidance for resolution of issues. Subject matter experts are invited to meetings on an as-needed basis to discuss critical topics that require specific attention. The weekly meetings, access to subject matter experts, and the review and approval of Ames Laboratory policies and procedures provide extensive operational awareness for the activities of the Ames Laboratory.

The chief operations officer (COO) responsibilities include the administrative and operations support departments of Accounting, Budget, Engineering Services, Facilities Services, Human Resources, Information Systems, and Purchasing & Property Services. The COO office manages multiple programs including: Foreign Visits and Assignments, Foreign Travel, Counterintelligence, and Conference Management. The COO also serves as chief financial officer (CFO) and chief information officer (CIO) and represents the Ames Laboratory in major DOE initiatives and contract modification discussions. In addition to administrative and support leadership, the COO position has a high degree of involvement with day-to-day operations including transactional approvals and oversight with an emphasis on contract compliance. This operational awareness includes understanding the risks within the operations environment of the Ames Laboratory and the processes in place to reduce or mitigate those risks. Also, the COO serves on the DOE Laboratory Contractor Assurance peer review team and coordinates the peer review for the contractor at Ames Laboratory.

The chief research officer (CRO) is responsible for initiating, developing, and supervising the Ames Laboratory's scientific programs, both current and future. In this capacity, the CRO evaluates new initiatives often emphasizing the cross-disciplinary collaborations with DOE and national/international institutions or laboratories that have become the Laboratory's hallmark. In conjunction with the deputy director, the CRO ensures the scientific programs are appropriately prioritized, budgeted, and scheduled within the Ames Laboratory's strategic plan. The CRO oversees the scientific division, which includes approximately 90 researchers, 200 students, and 20 support staff, and meets with the director on a regular basis, not less than weekly, to discuss current and future scientific efforts of the Laboratory. The CRO also has regular interactions with DOE regarding research efforts (past, current and future); with administrators and scientists at other national laboratories to facilitate interactions and collaborations; and researchers worldwide to facilitate collaborations. In sum, the CRO is responsible for the Laboratory's research

programs.

The organizational structures of the scientific programs and the technical and administrative departments consist of multiple research or technical groups and administrative sections. These groups and sections provide significant oversight of the daily activities of the Ames Laboratory through transactional approvals and participation in assessments. Additional Laboratory-wide organizational oversight is primarily of the supervisory-employee type and of the professor-student mentor type.

Additional explanation of the administrative and support organizations of the Ames Laboratory is provided by the following documentation.

Human resources management is a cooperative effort between the Ames Laboratory Human Resources department and the ISU Human Resource Services department. This arrangement provides additional segregation of duties and another layer of corporate oversight, as every hire is reviewed by ISU, the contractor. Employee roles and responsibilities are primarily documented through position descriptions as part of the hiring process, with additional definition of roles and responsibilities provided through process documentation and a needs assessment process including completion of a hazard inventory (HI), a job task analysis (JTA), and a training needs questionnaire. Annual performance evaluations are conducted to document individual performance and to ascertain if the employee would benefit from additional training to perform their assigned job activities. ISU faculty members are evaluated by their home department.

Occupational Medicine services are offered jointly with ISU through a contract agreement. An Introduction of Occupational Medicine manual describes services offered and processes used at ISU and Ames Laboratory. The Occupational Medicine office provides medical surveillance and assistance to employees who work with materials and under conditions that have identified and/or regulated risks. The program is also intended to enhance the efficiency of existing safety and health programs and assure compliance with applicable regulations. The Environment, Safety, Health and Assurance (ESH&A) office helps identify potential occupational health hazards, evaluates the extent of the exposure and then coordinates with the occupational medicine physician to ensure that adequate measures are taken to properly protect employee health and safety. Identifying potential problems in their early stages prevents unnecessary health risks to employees and provides improved management of occupational health. All personnel have access to this office when job related injuries or illnesses occur.

Financial Management (Accounting and Budget departments) and Purchasing and Property Services use similar strategies for business assurance due to type and interconnection of activities. The Ames Laboratory maintains its own services for these operational areas primarily due to the requirements that are derived from the Federal Acquisition Regulation (FAR) and the Department of Energy Acquisition Regulation (DEAR) rather than the Code of Iowa. The assurance fundamentals of risk assessments, financial analysis, financial management reviews, financial performance goals and metrics and the coordination of oversight activities are present in each of these areas, and are used to provide reasonable assurance of compliance to the myriad of requirements and responsibilities under the Ames Laboratory contract with DOE. Assurance tools are used at every level of Ames Laboratory business activity, where applicable, at the primary task level through upper management approvals. The Laboratory also makes use of independent views, such as internal audits, Office of Inspector General's audits, peer reviews, and site office oversight. An example is that a member of the ISU procurement office attended

the PERT Review of the Laboratory's purchasing system as conducted by DOE. The use of fundamental business assurance tools assures that financial systems provide adequate information for managing resources to accomplish program goals, accurate and relevant financial reporting, adherence to laws, regulations, and financial contract clauses, and effective and efficient use of government resources.

Funding needs at the Laboratory are based on input from department managers, program directors, and subject matter experts, and they are documented according to instructions communicated by the Ames Laboratory's budget officer. Budget requests are developed with assistance and direction from budget office analysts to ensure that each package represents the cost of accomplishing the required level of activity. For indirect funded programs, incremental budget requests are prepared if additional levels of funding are required to provide new or significantly modified activities or out-of cycle funding needs.

The Ames Laboratory's computing resources and information systems are controlled and maintained by the respective departmental manager, program director, or by the Information Systems office. Cyber security is an example of a functional area where the requirements derived from directives within the contract go above and beyond those of ISU, but in this case the Ames Laboratory and ISU work together to enhance operational performance and awareness for the contractor. For example, the ISU chief information officers' staff conducted a review of the Ames Laboratory's moderate level base lines as a part of a cyber security self-assessment, and an ISU staff person is a member of the Ames Laboratory Information Technology Advisory Group (iTAG), which reports to the Ames Laboratory Executive Council and advises the Information Systems office on policies, procedures, and planning related to network and cyber systems used by research and support staff of the Laboratory.

The cyber security program has been established to ensure a secure yet open environment for information systems is maintained, consistent with a laboratory that does not conduct classified research or maintain classified information. All computing resources at Ames Laboratory are required to conform to the management and operational controls specified in NIST SP 800-53 Rev 3 for the appropriate level of risk required to protect the Laboratory's information. Primary documentation resides in the Ames Laboratory's Cyber Security Protection Plan (CSPP). The CSPP is updated as major changes occur to the environment, and associated risks are continuously monitored. Cyber security is recognized as a management responsibility, and all levels of line management are responsible for exercising security in their day-to-day operations and long-term planning.

The Facilities Services (FS) department provides services to research and support organizations and performs facilities planning and management for DOE owned facilities. Its mission is to provide and maintain physical facilities that meet the current needs and supports the mission of the Laboratory while also providing a stewardship of the infrastructure to support future needs. The goal is to do this safely and efficiently. Primary responsibilities include:

- Facility infrastructure planning & management, infrastructure maintenance including planned maintenance and corrective maintenance.
- Custodial services.
- Research program and department-specific work requests such as equipment installation, space remodeling, and staff relocations.
- Planning, design, and execution of capital improvement, capital renewal, and rehabilitation projects.

FS also has responsibility for emergency management, keys and access control, telephones, In-house energy management, utilities management, facility information management system, and sub-contractor oversight. Emergency management processes are documented in the Ames Laboratory Emergency Plan (Plan 46300.001) and the Emergency Plan Implementation Procedure (Procedure 46300.010). Depending on the scope and complexity of a project, FS uses outside sub-contractors for architectural/engineering services, maintenance, and construction services.

Engineering Services (ES) is a service provider that builds and maintains novel, unique, and state-of-the-art highly technical research equipment. Services include mechanical design, mechanical development shop work and electronics shop work. The ES manager serves on the safety review committee, electrical safety committee, fire safety committee, and information technology advisory group. ES is responsible for the Ames Laboratory's suspect and counterfeit parts, pressure safety, and procurement quality assurance programs. ES is also responsible for compliance with many technical standards related to the operation of the Ames Laboratory. ES staff members serve as subject matter experts on various committees focused on compliance and quality assurance and thereby support the Laboratory's process improvement and assurance activities.

Public Affairs promotes the science of the Ames Laboratory using various communications tools, such as news releases; social media outlets (Facebook, Twitter, flickr, etc.); its semiannual science magazine, Inquiry; Web pages; DOE Pulse e-zine; and video presentations. In addition, the office provides information to key stakeholders through outreach activities, such as facility tours, interactive displays and invited talks. The Laboratory Public Affairs office follows a chain of command in the preparation of its news releases, which includes approvals from the Office of Science's Chicago and Headquarters Public Affairs offices. Also, Ames Laboratory has a courtesy arrangement with Iowa State University's communications office that includes sharing of any pertinent news releases and information on shared topics of interest in advance of the release of such information to the public. Public Affairs also directs the Laboratory's numerous education programs and its Graphics department, which provides design, photography and printing services in support of the Lab's mission.

The Environment, Safety, Health and Assurance (ESH&A) office provides leadership and technical support for the Ames Laboratory's programs involving safety, environmental management, training, records management, quality assurance, and safeguards and security. These efforts include numerous assurance and improvement processes established by the Integrated Safety Management System, Integrated Safeguards and Security Management System, Quality Assurance Program, and Ames Laboratory Environment, Safety, Health and Assurance (ESH&A) Program.

The Ames Laboratory's Office of Sponsored Research Administration (OSRA) is responsible for various functions within the Directors' Office. The primary goal of OSRA is to efficiently and effectively work to enhance technology transfer activities in the area of cooperative research and development agreements (CRADAs), federal and non-federal work for others (WFOs) agreements and intellectual property and, thus, use unique capabilities inherent with Ames Laboratory for other federal and non-federal entities while maintaining these capabilities to meet the DOE mission. The Ames Laboratory uses a multifaceted approach and extensive cooperation with ISU and the DOE to bring the results of its research programs to public and

private sector beneficiaries and to enhance the U.S. industrial competitiveness. Major technology transfer efforts include: the maintenance of an Office of Research and Technology Application (ORTA), coordination with potential research or licensing partners, collaborative research activities with other universities and other industrial scientists, and cooperative projects with other agencies and industry. Included in these activities is consultation with ISU's general counsel on various legal issues that arise and with Iowa State University Research Foundation (ISURF) in regards to the contractor's privately-funded technology transfer activities which covers patenting and licensing of Ames Laboratory technologies. This office is also responsible for the export control functions within the Laboratory.

The Internal Audit office provides independent, objective assurance and consulting services designed to add value and to improve the Ames Laboratory's operations. Internal Audit helps the Laboratory accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes. The scope of work of Internal Audit is to determine whether the organization's network of risk management, control and governance processes, as designed and represented by management, is adequate and functioning as intended by management. Annual audit plans are developed based upon perceived risks pertaining to compliance and financial stewardship responsibilities under the contract.

The Iowa State University Office of University Counsel provides legal services to Ames Laboratory. This arrangement ensures that ISU has full awareness of legal activities involving the Laboratory.

5.0 PROGRAM ELEMENTS

The Laboratory uses numerous mechanisms to identify, collect, process, and resolve deficiencies and process improvement opportunities. Many of the causal factors related to these issues are fully addressed within the base levels of line management and through application of the organization's resources. Some programmatic and institutional-level issues require significant resource commitments and institutional infrastructure, process, or cultural changes that impact the Ames Laboratory's business strategy or require active, visible support of the Laboratory's upper management. Ames Laboratory uses institutional processes such as line management supervision, trend analysis, and oversight reports, including self-assessments to clarify process issues. The Laboratory prioritizes resource allocations through its annual budgeting process, with consideration of outstanding process deficiencies and opportunities for improvement. The following program elements provide a roadmap to the primary assurance activities associated with the Ames Laboratory.

5.1. Risk Definition

Although risk is often viewed only as something negative and to be avoided or eliminated, the Ames Laboratory views risk with awareness that successful risk taking can lead to a competitive advantage, efficiency of operations, and increased stakeholder value. The risk-return relationship is first viewed across the Ames Laboratory as a single entity, rather than only within the traditional departmental approaches to managing processes and allocating resources. This approach allows limited resources to be effectively and efficiently applied to address the greatest risks while not significantly burdening all the Laboratory functions with unnecessary process rigor and granularity.

The Ames Laboratory is a small facility, based on its DOE funding level of ~$35M and in

comparison to the other DOE-SC national laboratories, and a low hazard facility, based on the nature of the Laboratory's bench-scale non-nuclear research activities. Although the Ames Laboratory has a small funding level, it is subject to fundamentally the same requirements and DOE oversight for its business and financial transactions as other much larger DOE national laboratories. In several situations, especially in the financial and human resource functions, the Ames Laboratory may have more transactional oversight due to its close operational integration with ISU. Also, the financial thresholds for transactional approvals by the Ames Site Office are often lower than the controls established for other laboratories, due to the limited number of "high value" transactions at Ames Laboratory. The limited number of "high value" transactions, the added involvement of ISU, and the exceptional performance history of Ames Laboratory reduce the need for additional controls and rigorous formal issue management processes. There simply is a very low likelihood of severely negative financial and business function issues at the Ames Laboratory.

A similar argument can be presented for the hazards and risks associated with the Ames Laboratory standard non-office activities, such as: research experiments, construction and maintenance activities, and safety and security functions. Ames Laboratory does not conduct nuclear or classified activities, and the Laboratory has implemented process controls in accord with hazards identified through its readiness review process. Based on readiness reviews of defined activities, past formal hazard assessments, and annual hazard surveys, Ames Laboratory is a low-hazard facility with hazardous materials below emergency management threshold-planning quantities. There is an extremely low likelihood for negative off-site impacts due to the potential hazards associated the Ames Laboratory activities. There is a low likelihood of negative onsite impacts due to Laboratory activities, but the Laboratory's research and support activities do involve potential hazards that could result in significant injury or illness if protection strategies fail or are misapplied. Likewise, the Laboratory's safeguards and security activities have intrinsic hazards that could produce significant offsite concerns and potentially impact DOE, ISU, and Ames Laboratory reputations and mission success. Therefore, Ames Laboratory has instituted formal issue management processes, as described in Section 3.5 of this document, to ensure safety, security, and emergency management deficiencies are fully identified, investigated, tracked, resolved, and trended.

5.2. Performance Measurement and Operational Awareness

The Ames Laboratory, in partnership and cooperation with DOE, has established multiple mechanisms to measure the performance of its staff, research programs, and support departments. Likewise, the operational awareness activities within the Ames Laboratory, provided by ISU, and established by DOE-Ames Site Office and Office of Science approvals, measure performance of Ames Laboratory processes. The Laboratory's assessment and audit activities provide additional sources of performance data. The collection, analysis, and correlation of these data is used directly or indirectly to establish performance improvement or deterioration and is assessed relative to established goals.

The Ames Laboratory's performance is assessed annually and rated for each Performance Evaluation and Measurement Plan (PEMP) element in the Laboratory's contract with DOE. The established PEMP elements can drive specific actions at the Laboratory and often focus attention of programs and departments toward fulfillment of

performance goals. The Ames Laboratory submits an End of Year Report including ratings for each PEMP element and the Laboratory overall, and a summary of key notable outcomes, strengths, and opportunities for improvement. The Laboratory develops its performance report using the output of the oversight and assurance program elements presented throughout this document.

The DOE, as part of its responsibility for oversight and information exchange, provides programmatic and other reviews of the Ames Laboratory's performance of authorized work in accordance with the terms and conditions of its contract. The Office of Science, through the DOE Ames Site Office manager, has lead responsibility for this oversight and annually prepares a written assessment of the Laboratory's performance, based upon the process described in the Laboratory's contract in Appendix B. The performance levels achieved against the specific goals, objectives, measures, and targets are the primary, but not sole, criteria for determining the Ames Laboratory's final performance evaluation and rating, as documented in the Ames Laboratory annual performance appraisal

5.3. Assessments

Managing risk is a primary responsibility of line management. From the director to staff (including students), everyone must be alert to the risks associated with assigned tasks. Line management evaluates the risks associated with business processes and develops internal controls to mitigate those risks. The Ames Laboratory uses a risk-based approach in determining the level of oversight needed for a particular process, including both the frequency and granularity of reviews. Line management is responsible to re-evaluate process risks periodically as results of assessments identify weaknesses in process performance.

Ames Laboratory and ISU have implemented a variety of assessment types at multiple management levels and with a varied degree of independence to determine the effectiveness of policies, requirements, and standards, as well as implementation status. The primary assessment types used for Ames Laboratory processes are:

- Self-assessments and management assessments,
- Internal independent assessments,
- Other structured operational awareness activities, and
- External and independent assessment, peer reviews, and certification.

5.3.1. Self-Assessments and Management Assessments

Ames Laboratory conducts self-assessment and management assessment activities to provide additional assurance of compliance with requirements and fulfillment of performance objectives.

These activities include: line management oversight of work processes, safety and cyber security related oversight provided by safety coordinators and assistant computer protection managers (ACPMs), walk-throughs as defined by Program/Department Walk-Through (Procedure 10200.014), and performance summaries and self-assessment activities performed as part of the PEMP process.

Line management oversight, as performed by supervisors and organizational unit leaders, is the primary element of oversight, direction, and guidance of work activities

and processes, although each individual at the Ames Laboratory also has responsibilities for the quality and safety of her/his activities. Program directors and department managers have additional responsibilities for the allocation of resources and the management of hazards and risks associated with the activities within their organizations. Line management periodically reviews work activities, corrects identified deficiencies, and implements opportunities for improvement. Also, line managers have significant responsibilities for oversight of safeguards and security, cyber security, and emergency management related activities within their organizations.

The Laboratory has developed collateral duties for special employees within line organizations through its Safety Coordinator & Representative Program (Plan 10200.009) and its ACPM program. These positions are appointed by program directors or department managers to assist with and enhance safety and computer protection activities in line organizations. Safety coordinators and representatives assist with workplace safety implementation practices and facilitate communication on workplace health, safety, and environmental issues between line management and the ESH&A office. ACPMs distribute and respond to security notices, report and respond to cyber security incidents, oversee policies and procedures, and assist in the day to day management of computational resources. Some ACPMs have delegated responsibilities to group administrators to facilitate policy implementation.

Program directors and department managers use walk-throughs, performed at a minimum frequency of once per year, in accord with Program/Department Walk-Through (Procedure 10200.014), to assess workplace hazards. These walk-throughs are performed by line management for self identification and correction of deficiencies, as well as for increased organizational awareness. The walk-throughs are primarily focused on safety issues, but also encompass security and emergency management issues, and are ideal interactions for the identification of the initiation of process improvements efforts. Safety coordinators and safety representatives assist line managers in program and department walk-throughs. Hazard Identification training (AL-130) is mandatory for safety coordinators and representatives and suggested for group leaders. Safety coordinators and representatives are also provided training (AL-031) on preparation of walk-through reports. Documentation of these walk-throughs is kept with the line organization and unresolved issues are to be elevated within line management, and, if necessary, presented to the ESH&A manager, safeguards and security program director, cyber security officer, or emergency coordinator.

Ames Laboratory functional lead offices conduct additional self-assessment efforts as a means of determining and documenting compliance with the Laboratory's contract performance indicators, as detailed in the Performance Evaluation and Measurement Plan (PEMP) with DOE.

5.3.2 Internal Independent Assessments

Several types of internal independent assessments mechanisms are used by the Ames Laboratory: independent walk-throughs, topical appraisals, internal audits and discrepancy reports. These assessments are in addition to the observations by workers and provide objective review of conditions in the work place and the status of the implementation of regulatory requirements.

Two types of independent walk-throughs are performed across all Laboratory departments and programs. An independent assessment related to safety, security, and emergency management is described in a sub-section of Section 10, Assessment Program of the ESH&A Program Manual (Manual 10200.002) and in the Independent Walk-Through Procedure (Procedure 10200.021). Independent walk-throughs are performed to assess the Laboratory's overall compliance with safety, security, engineering, and life safety requirements, and communicate the directorship's support for and awareness of workplace and operational hazard mitigation. This walk-through involves a member of the executive council, the program director or department manager, a representative of ISU's Environmental Health and Safety (EH&S) department, the Laboratory's electrical safety specialist and several technical safety specialists. ESH&A coordinates these walk-throughs and tracks observations as findings, strengths, and noteworthy practices.

Also, an Ames Laboratory cyber security team conducts walk-throughs of program and department computer systems on a routine, scheduled basis, according to the Laboratory Cyber Security Walk-Through Procedure (Procedure 48400.010). Members of the team have adequate technical understanding of the Laboratory's cyber security requirements and policies and receive orientation on effective walk-through processes. Results are ranked, categorized and tracked in a database.

In addition to the walk-throughs, technical specialists perform topical appraisals related to safety, safeguards and security, cyber security and emergency management. Ames Laboratory works with the Ames Site Office to determine specific topics of appraisals as described in Plan 10200.022, Topical Appraisals. Topical appraisals are performed by SMEs to provide periodic validation of compliance with safety requirements and direct feedback on areas of improvement. The frequency and rigor of topical appraisals are determined after consideration of statutory or DOE requirements, walk-through data, injury/illness data, lessons learned information, Event reporting program, employee safety concerns and/or other "feedback" information. Each topical appraisal is documented by a written report. Observations are defined as findings, strengths, and noteworthy practices based upon consequence and risk potential, and issues are tracked by ESH&A.

Internal audits are primarily performed by the Ames Laboratory Internal Audit Office. Internal audit develops annual audit plans through a risk-based prioritization of audit subjects after requesting relevant input from line management and working with the Laboratory director and COO. Internal audit also participates in the cooperative audit strategy at DOE which is coordinated through the DOE Inspector General (IG) Office. Audit reports are submitted to line management, DOE management, the DOE IG, and ISU along with the state board of regents. A corrective action tracking process is used to ensure that corrective actions are completed in a timely manner. It is the responsibility of the program or department to perform the actions necessary to close out the concerns identified during the assessments. As part of ISU, the transactions of the Laboratory are also subject to review by ISU internal auditors and state of Iowa auditors. Typically, these audits focus on university-wide processes and supporting transactions which may include Laboratory transactions. As a result of internal audits, and in addition to formal corrective actions, line managers can choose to institute additional process control strategies and oversight mechanisms to further adjust process performance.

Another example of independent assessments is the documented observations made by the plant protection section (PPS) during patrol tours. These observations are generally based on OSHA, NFPA, DOE, and industry consensus standards. Incidents that pose an immediate threat or equipment failure are addressed by the officer at the time of the discovery, the actions taken are noted on a discrepancy report, and necessary notifications are made. Discrepancy reports are reviewed the following workday by the PPS coordinator, and observations are categories as one of three designations: safety, procedural, or incident. Safety issues stem from the principles of general industry standards, NFPA codes or ESH&A program manual. Procedural issues are most closely affiliated with security issues, such as unlocked doors or windows, and incidents are issues that the citing officer and the reviewer feel may be of interest to the person in charge of the area, such as water leaks that may repaired during off-hours.

5.3.3 Other Structured Operational Activities

A foundational assurance component at Ames Laboratory is structured operational awareness in the forms of transactional reviews and approvals. This transactional oversight occurs at multiple organizational levels, including the executive council, and it provides a significant level of assurance of daily activities. In addition, given the structure of the contractor organization, Ames Laboratory operates somewhat as a department of ISU, and as such, many of the Laboratory transactions are also reviewed by contractor staff to ensure compliance with ISU policies and procedures.

At least one member of the Ames Laboratory executive council reviews and approves every scientific research, work-for-others (WFO), support function, or other unique activity reflected in the Laboratory budget. In addition, research proposals are also reviewed and approved by the program director or department manager of the proposed activity, the budget office, the ESH&A office, and the export control officer.

Personnel actions are approved at several levels, including the director, budget office, and human resource office. Associateship appointments are approved by the responsible program or department, the CRO, and the deputy director. Reclassifications are reviewed by the assistant human resource manager and, in some cases, a committee prior to submission for ISU review.

Purchasing requisitions, including travel, are reviewed and approved according to predetermined authorization authorities. The budget office also validates the signatures prior to release of requisitions to the purchasing office for processing. Prior DOE written approval is required for any subcontract having a value of $500,000 or more and any inter-contractor purchases (ICPs) expected to exceed $1 million. Vendor sources are tracked to meet small and small disadvantaged business goals. Semiannual and annual reports are submitted for review and approval through the eSRS Web portal for DOE and SBA to validate performance. The travel approval process is monitored by the accounting staff and the COO. Travel documents are individually scrutinized and approved.

The COO reviews travel, and approves subscriptions, memberships, conferences, foreign travel, foreign visits, and human subjects research. ISU accounting reviews

vouchers and travel expense statements for compliance with IRS reporting requirements. Upper management approves research related transactions over $5,000 and support offices transactions over $2,000. Monthly reports and system queries allow for checks and balances on the system. Standard Accounting and Reporting System (STARS) reports are monitored for accuracy. In addition, internal financial statements are prepared, reviewed, reconciled, and internal audit processes performed.

In-house service order requisitions also include multiple levels of review and approval according to an established process. Facilities Services also uses preventive and corrective maintenance tickets associated with routine activities to ensure activities are appropriately planned, reviewed, approved, tracked, and closed out.

Cyber security personnel perform daily monitoring and surveillance activities for identification of vulnerabilities, protection deficiencies, and intrusion attempts. Performance monitoring tools are deployed at key points on the network to track network use efficiency. Network downtime and equipment failure are documented and each event analyzed to identify future process improvements for network maintenance.

5.3.4 External, Independent, Peer Reviews, and Certification

External, independent, and peer reviews are intended to determine the extent to which assurance systems are in place, perform effectively, produce desired outcomes, and appropriately engage the key organizational players. The Laboratory makes use of independent views, such as external reviews, peer reviews, and site office oversight. A listing of reviews at the Ames Laboratory shows examples of external reviews, although the Laboratory uses fewer external reviews than larger multiple purpose laboratories, due to its size and the limited complexity of its business systems and research facilities. External reviews of ISU's systems also provide assurance that systems used by the Laboratory are in compliance with State, and in some cases federal laws. Examples include reviews and audits of EEO policies and ISU's Research Foundation, the Laboratory's privately funded technology transfer agent.

Contractor assurance systems are not required to be identical in terms of processes, tools, and methods, and albeit Ames Laboratory's assurance approach has limited application of external reviews, it does include the well-rounded audit and oversight strategy of the DOE AMSO, through regularly scheduled assessments. Examples of pending peer reviews are the Office of Science's Mission Readiness Assessment in FY2011, and the Office of Science's contractor assurance system peer review in FY2012.

The DOE-SC has decided to use a peer review process for the initial review of contractor assurance systems at each of its sites to provide assurance that the H Clause requirements are being effectively implemented, and to identify and share best practices and lessons learned to enable continuous improvement. A CAS peer review guide has been developed by DOE-SC and its contractors to support the execution of peer reviews in a manner that produces consistent, objective feedback that can be used to mature and build upon existing contractor assurance systems.

5.4 Worker Feedback Mechanisms

The most efficient and effective process for identification and correction of process deficiencies is the observation by individual employees. Direct line supervisors provide

individual work instructions, as pre-job briefings, post-job reviews, safety meetings, job hazard walk-downs, etc., and each worker is accountable for performing quality work in a safe and productive manner. Employees are charged with the responsibility of continuously assessing their individual performances and their workspaces in order to prevent problems and to identify nonconforming conditions and opportunities for improvement.

Employees are initially informed of their worker observation responsibilities in General Employee Training (GET) For New Employees (AL-001). Workers are encouraged to assess their work and work environments in order to identify process weaknesses and potential hazards. A Worker Observation Guide (Guide 10200.003) is available to assist workers in the observation of activities within office spaces and laboratory/shop spaces. Work deficiencies should be corrected as soon as possible by the workers involved with the activity and reported to the first level of management. Resolution of concerns should occur at the level of line management most directly responsible for the activity. If the issue cannot be resolved at this level, the employee is directed to proceed within management structure or to report the concern to the ESH&A office as part of the Employee Safety and Security Concerns Program (Plan10200.008), or through the DOE hotline.

Additionally, the Laboratory's Stop Work Authority (Policy 10200.005, Section 5.2 of the ESH&A Program Manual (Manual 10200.002) provides employees with a process to prevent serious injury, impairment of health, or adverse impact to the environment without waiting for a formal reporting process to initiate corrective actions. The Readiness Review Procedure (Procedure 10200.010) is used to start up operations that have been shut down under stop work authority.

In accordance with DOE Order 221.1A Reporting Fraud, Waste and Abuse to the Office of Inspector General, the Ames Laboratory Human Resources office annually notifies employees of their duty to report allegations of fraud, waste, abuse, misuse, corruption, criminal acts, or mismanagement relating to DOE programs, operations, facilities, contracts, or information technology systems to an appropriate authority (…Laboratory Management, Executive Council, ESDH&A, Safeguards and Security, the ISU Executive Vice-President/Provost or the University President).

Ames Laboratory also uses ISU's EthicsPoint application to provide simple, risk-free ways to anonymously and confidentially report activities that may involve criminal, unethical, or otherwise inappropriate behavior in violation of policies. Employees may file a report to ISU on a web site or by telephone through EthicsPoint by dialing toll-free 866-384-4277. EthicsPoint does not divulge the identity of a hotline reporter without the reporter's consent. No retaliatory action will be taken against anyone for reporting or inquiring in good faith about potential breaches of policies or for seeking guidance on how to handle suspected breaches. Reports submitted via EthicsPoint are handled promptly and discreetly. Reports are reviewed by the ISU hotline administrators, who then investigate the claims or refer them to the appropriate university official, such as the Ames Laboratory director.

Professional and scientific, faculty, and collective bargaining unit workers are provided specific additional mechanisms for resolution of employee relations issues, according to

established and documented processes.

5.5 Issues Management

The Ames Laboratory uses a comprehensive approach to issue management. A formal, documented, and rigorous approach is applied to the management of issues related to safety, security, cyber security, and emergency management. Less formal approaches are applied to issues related to business and financial functions, and of issues related to programmatic and mission functions of research.

Issues related to safety, security, cyber security, and emergency management
The Laboratory uses formal, documented processes to ensure that safety and security issues, identified through its numerous institutional oversight mechanisms, are investigated, reviewed, analyzed, reported, and shared. It is also the policy of Ames Laboratory to encourage a positive attitude toward reporting issues of concern. The Laboratory's Event Reporting Program (Plan 40000.001) identifies issues, reports, analyzes, and addresses operational events, accidents, and injuries. Event reporting is designed to ensure that Laboratory management and DOE officials are kept informed of all events and conditions which could affect the health and safety of the public, seriously impact the intended purpose of Laboratory facilities, have a noticeable adverse effect on the environment, impact safeguards and security, or endanger the health and safety of workers.

Events and incidents are generally identified by the direct observations of workers, a Laboratory screening team, line management walk-throughs, independent walk-throughs, or external assessment processes. The Laboratory's event screening team consists of a group of individuals representing diverse functional areas such as: fire and plant protection, industrial hygiene, industrial safety, plant engineering, radiation safety, environmental protection, and packaging and transportation. Event categorization is conducted by a diverse group of Laboratory specialists. The event reporting process also defines responsibilities for investigation and causal analysis of events based on significance, severity, or risk associated with the event.

Corrective action plan development and tracking is performed according to an established process, as discussed in section 3.6. Lessons learned are shared as discussed in section 3.7. Also, reports are developed and shared with oversight organizations, regulatory bodies, and other research facilities.

Issues related to business and financial functions
The processes used to manage issues related to business and financial functions are less formalized. None-the-less, issues discovered through observations, transactional approvals, assessments, and internal audits are addressed by line management and in more serious cases, the Laboratory's executive council. Suggestions are solicited through an email address, operations@ameslab.gov, which sends concerns to the COO and the Laboratory's assurance officer. Issues and corrective actions are tracked by the assurance officer, and the Internal Audit Office tracks issues identified through internal audits.

Issues related to programmatic and mission functions of research
Issues related to the programmatic and mission functions of research are addressed by

Laboratory senior management and in some situations after interactions of ISU and the Ames Laboratory Oversight Board (ALOB), according to ad hoc and Laboratory business processes applicable to the specific issue. Such issues are generally discovered through scheduled program reviews by the DOE, mid-term program reviews by ISU, and oversight activities of Laboratory program directors and the DOE program managers. The Chief Research Officer (CRO) and the laboratory director have overall responsibility for the resolution and documentation of research programmatic related issues.
The director and CRO schedule periodic meetings with HQ officials to get feedback on Laboratory research results and peer review issues lead to corrective actions that are acted on by management. Performance grades and reports are reviewed for opportunities for improvement.

Issues related to technology transfer activities
Issues related to research performed under a Cooperative Research and Development Agreement (CRADA) or a WFO agreement are addressed by the associate director in discussion with the researcher(s), the Budget Officer, and the partner. If the issue cannot be resolved by these parties, the Laboratory provides its industrial R&D partners, and those in the broader marketplace with questions about Ames Laboratory R&D, with a neutral and a confidential point of contact for voicing these concerns. The Ombuds acts as an advocate for a fair process and the Ames Laboratory's institutional values, rather than an advocate for any specific party. While the Ombuds may assist R&D partners and other firms with a problem-solving process, the ultimate "ownership" of the concerns and their resolution resides with the parties involved.

5.6 Corrective Action Development, Tracking and Verification

Corrective actions and corrective action plans (CAPs) are generally developed by the line management entity with the related process responsibility and reviewed according to established protocols. CAPs related to internal audit office findings are reviewed and approved according to the IA process, which is articulated in Management Corrective Action Plans (Procedure 10300.001). CAPs for internally identified issues of business functional areas are developed according to office processes and approved by the department manager. CAPs for issues identified by external reviews are subject to processes of the audit entity, with review by department managers and the Laboratory's Assurance Officer. CAPs related to safety, security, and emergency management are subject to the processes outlined in Corrective Action Development, Tracking, and Verification (Procedure 10200.039).

The following guidance is used to ensure corrective actions are designed to correct the identified need and to prevent recurrence of the deficiency:

- Review the standard against which the condition is being assessed.
- Develop an understanding of the basis, scope (e.g., dollar impact) and cause of the deficiency, including the extent of conditions/causal factors that led to the deficiency.
- Examine existing documentation of programs and practices related to the deficiency.
- Provide a description of the proposed action(s) that will effectively resolve the issue(s).
- Designate a responsible individual and associated line management as points of contact for the corrective action.
- Review resource needs for proposed actions with appropriate line management.

- Establish a planned completion date for the corrective action, which allows adequate time to address the corrective action and ensures a timely response to the deficiency.
- Develop or modify documentation for programs and practices related to the deficiency.
- Include the causal factors of the deficiency in periodic trend analysis, such as Trend Analysis of ES&H Concerns (Procedure 10200.041).
- Provide a general description of the mechanism used to verify the status of the corrective action, including any specific deliverables, which signify partial or total completion.
- If appropriate, provide a general description of the mechanism used to verify the effectiveness of the corrective action.

The Laboratory also recognizes the importance of tracking corrective action plans, verifying completion, and reviewing effectiveness. With the exception of Internal Audit, the Laboratory Assurance Officer has responsibility for tracking corrective actions related to business and financial functions. Line management and the Assurance Officer have responsibility for verification of completion and effectiveness of corrective actions. The responsibilities for tracking, verification, and effectiveness of safety, security, and emergency management CAPs are established by Corrective Action Development, Tracking, and Verification (Procedure 10200.039).

5.7 Lessons Learned

Ames Laboratory employs a broad approach and multiple levels of formality for its lessons learned efforts. Generally, informal approaches are used by business process functional areas, and a documented approach, with established procedures, is implemented for safety, as detailed in the Operating Experiences and Lessons Learned Program Plan (Plan 10200.020). All of these approaches are based on open communication and discussions of the applicability of information among subject matter experts (SMEs) at the DOE facilities.

Generally, office managers and functional area leads participate in annual or semi-annual meetings with representatives from other DOE national laboratories. Typically, these interactions are complemented by conference calls and ad hoc task oriented communications between SMEs from two or more laboratories. More formal approaches are coordinated through councils such as the Contractor Financial Management Alliance (CFMA), a financial management information resource center available to the DOE contractor employees.

For safety related activities, the formal approach ensures internal and external lessons learned are communicated to appropriate staff. External sources such as the USDOE Lessons Learned list server, the Consumer Products Safety Commission list server and the Operating Experiences publications (including Special Operations Reports, Safety Alerts, Safety Advisories, and Safety Bulletins) have been chosen as reputable external sources for Lessons Learned information. Though few of the Laboratory's internal lessons learned have warranted sharing with the DOE complex, Ames Laboratory has significantly benefited from some of the lessons learned from other facilities. Examples

are the important issues involving laser safety and electrical safety that the DOE programs have shared during the past several years.

Another avenue of sharing lessons is through the close interactions between Ames Laboratory SMEs and their counterparts at ISU. The information exchanged with ISU can be of significant importance due to the similar culture of a university setting and the similarity of process rules as is the case for human resources; but the dissimilarity of budgeting and accounting practices can limit the value of close sharing of information.

The Laboratory's cyber security functional area uses the DOE sponsored systems to learn about lessons learned related to cyber security. In addition to weekly conference calls with other Laboratories regarding ongoing activities and recent incidents, a secured DOE-CIRC web portal called Aware contains alerts, information on past attacks, and additional issues for scrutiny.

5.8 Feedback and Improvement

Over the past two decades, Ames Laboratory strengthened many of its functional areas, including business and safety processes, as a result of the DOE assessments and the implementation of a formal quality assurance program. Improvement efforts addressed work planning, training, design, procurement, inspection & acceptance testing, documents and records management, and assessments. Also, the Laboratory's implementation of the principles and core functions of Integrated Safety Management (ISM), as presented by DOE Policy 450.4 Safety Management System Policy, and Integrated Safeguards and Security Management (ISSM), as presented by DOE Policy 470.1 Integrated Safeguards and Security Management (ISSM) Policy have resulted in implementation of sustainable improvement processes such as Readiness Review and Independent Walk-Through, as well as performance enhancements as evident by greatly reduced injury and illness statistics.

Likewise, improvement efforts have been successfully applied to the Laboratory's scientific programs. The steps to ensure the continuous improvement of scientific program results in a diverse research environment include selection of highly qualified and motivated people, the conduct of research, and the review of results by independent, appropriate peers.

Currently the Laboratory uses several feedback mechanisms in addition to audit results to drive performance improvement. Processes are in place to collect feedback from workers and performance results from systems and to communicate the results to decision makers, including program directors, department managers, subject matter experts, executive management, and oversight entities. Section 6.3, Criterion 3 - Quality Improvement, of the Laboratory's Quality Assurance Program (Plan 10200.026) further describes some of the improvement processes functioning at Ames Laboratory.

The Laboratory recognizes that an important and effective element for the identification and implementation of process improvements is the observation and action of individual employees. As such, Laboratory employees are charged with the responsibility of continuously assessing their individual performances and their workspaces in order to prevent problems and to identify nonconforming conditions and opportunities for improvement. The Worker Observation Guide (Guide 10200.003) is available to assist

workers in the observation of activities within office spaces and laboratory/shop spaces. Line supervisors combine direct worker feedback, process knowledge, pre-job briefings, post-job reviews, safety meetings, job hazard walk-downs, etc., to establish effective and improved work instructions.

Ames Laboratory also seeks to promptly address employee concerns and therefore an Employee Safety and Security Concerns Program (Plan 10200.008) has been established to encourage comments, opinions, and recommendations for the continuous improvement of work practices. ESH&A evaluates each concern and facilitates corrective actions, and concerns are tracked and trended each year.

An Ames Laboratory Event Screening Team has responsibility for quarterly performance analysis of information and events for identification of potential recurring events. Events identified as potentially recurring are submitted to the Event Categorization Team for review and, if warranted, categorized as a recurring occurrence and submitted as a new Occurrence Report.

Assessment and events typically result in observations, findings or opportunities for improvement, as well as lessons learned. Observations are investigated, analyzed, tracked, closed-out, and verified in accordance with their identified risk level. Improvements are also encouraged through the lessons learned activities, as described in Section 3.6 of this document.

Information from the various safety assessment and feedback mechanisms is reviewed according to the Laboratory's procedure for trend analysis, Trend Analysis of ES&H Concerns (Procedure 10200.041). This review is referenced in PEMP End of Year Report, and results of the trend analysis are also communicated to Laboratory management for review and planning purposes. The Laboratory also produces an annual update to its Laboratory Plan for review and discussion with the Office of Science. The plan provides a vision for the Laboratory's future activities including: enhancing its facilities and collaborations in materials discovery, synthesis and processing to access new materials with energy-relevant properties, and taking a distinctive lead in addressing new and improved compounds.

5.9 Performance Indicators and Measures

The Ames Laboratory has multiple mechanisms to measure the performance of its staff, research programs, and support departments. The collection, analysis, and correlation of these data are used directly or indirectly to assess performance improvement or deterioration relative to established goals, as documented in the Ames Laboratory Performance Evaluation and Measurement Plan (PEMP). Also, information from the various feedback mechanisms described in Section 3.7 Feedback and Improvement is reviewed according to the Laboratory's procedure for trend analysis, Trend Analysis of ES&H Concerns (Procedure 10200.041).

Personal and line management performance, feedback, and improvement goals are reviewed through an annual performance evaluation process and safety related performance is assessed according to performance measures communicated in the Safety Performance Measures Policy (Policy 10200.007). Guidelines for Safety Performance Evaluations (Guide 10200.002) are provided to assist supervisors in

reviewing individuals' safety performance during the annual performance review.

Another example of the Laboratory usage of performance indicators and measures is the Purchasing and Property Services department participation in the DOE Balanced Scorecard (BSC) self-assessment. The BSC provides a framework for translating specific goals and objectives into a set of indicators. The methodology allows the Laboratory to monitor performance, understand performance gaps, and then to improve processes. While some BSC objectives are set locally via a partnership between Ames Laboratory and its contracting officer or the Office of Program Management Operations (OPMO), others are directives/set goals from DOE headquarters. Year-end totals are tabulated using a graded approach and reported to the contracting officer and OPMO. Best practices are communicated to other Office of Science Laboratories when appropriate and suggestions for future improvements are reflected in the following year's BSC. Scoring is also reported in the year-end PEMP report.

The Laboratory's PEMP End of Year Report includes an overall summary of performance for the period and a summary of key strengths and opportunities for improvement. The DOE reviews the Laboratory's year-end report and establishes performance levels achieved by utilizing the specific goals, objectives, measures, and targets as the primary, but not sole, criteria for determining the Laboratory's final performance evaluation and rating.

5.10 Communication to Corporate Governance, AMSO and SC

The DOE and ISU derive direct knowledge of assurance activities at the Ames Laboratory through participation in many of the assessment and transactional approval mechanisms that constitute the contractor assurance system. In addition, a primary mechanism for communication of the Ames Laboratory's performance is the Ames Laboratory PEMP End of Year Report. The DOE Ames Site Office, with feedback from the Office of Science, annually prepares a written assessment of the Laboratory's performance, based upon the process described in the contract in Appendix B, PEMP.

The PEMP grading criteria defines operational performance at the Laboratory as meets DOE's expectation (which is defined as the grade of B+) for an objective if the performance is at a level that fully supports the Laboratory's current and future science and technology mission(s). Performance that has, or has the potential to: 1) adversely impact the delivery of the current and/or future DOE/Laboratory mission(s), 2) adversely impact the DOE and or the Laboratory's reputation, or 3) does not provide the competent people, necessary facilities and robust systems necessary to ensure sustainable performance, is graded below expectations. The Ames Laboratory performance ratings are presented in an annual report card.

The Ames Laboratory and ISU annually provide DOE with assurance statements through a Management Representation letter and an Internal Control Program Assurance memorandum (as per Federal Managers' Financial Integrity Act of 1982). The Management Representation letter is a statement wherein the director confirms responsibility for the fair presentation of the Ames Laboratory's financial statements, in conformity with principles generally accepted in the United States of America. As a DOE element, the Laboratory is required to report annually on the results of its management control reviews and financial systems evaluations. The purpose is to identify concerns

that have been raised regarding management controls, with either direct or indirect implication for the respective Headquarters or field elements. The Internal Control Program Assurance letter relates primarily to financial controls. ISU's vice-president for business and finance, after consideration of all existing information, reports annually to the AMSO on the status of internal control, including internal control over financial reporting and financial management systems.

6.0 THE FUTURE OF CONTRACTOR ASSURANCE AT AMES LABORATORY

The maturation of Contractor Assurance at Ames Laboratory will include regular reviews of the Contractor Assurance System Description document. Those reviews will focus on risk analysis and mitigation. Efforts will continue to find the optimal level of oversight, reviews and controls needed to provide the desired level of assurance, this is a continuing challenge given the size of the lab. Ames Laboratory looks forward to building on the partnership (Partnership Commitment) with the Ames Site Office and Iowa State University to further the mission and enhance trust and transparency.

The suggestions from the Contractor Assurance Peer Review have helped focus efforts to improve the Contractor Assurance System of the laboratory. Two suggestions were embraced by laboratory management. These were to identify useful metrics to measure efficiencies at the laboratory and to enhance efforts for succession planning to address an aging workforce.

7.0 REFERENCES

- Plan 10200.026, Quality Assurance Program
- Plan 10200.016, Integrated Safety Management System
- Plan 10200.029, Integrated Safeguards and Security Management System
- Manual 10200.002, Environment, Safety, Health and Assurance (ESH&A) Program